

REMARKS

Claims 1-47 remain pending in the application. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

Before addressing the substantive issues raised in the Office Action, it is noted that the Office returned one of Applicant's Information Disclosure Statements (IDSs) (specifically, the one filed on April 7, 2005) with the Examiner's initials inserted to indicate his consideration of the corresponding references, except that four of the cited references (i.e., the ones to Hedberg et al., Zhang et al., Müller et al., and Ekudden et al.) were not considered on the grounds that there was "no date available" and that the "MPEP requires both month and year."

In response, it is respectfully noted that Applicant's IDS of April 7, 2005 was in full compliance with the applicable statute and regulations. For example, 37 CFR §1.98(b)(5) states: "Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication." Nothing in the regulations requires an applicant to provide a month of publication, *especially when such information is not made available by the publisher of an article*. Accordingly, Applicant cannot understand an internal Office policy (as stated in the MPEP) that, despite an applicant's full compliance with statutes and regulations, prevents an Examiner from indicating his consideration of references submitted.

In any case, the MPEP §609.04(a) at page 600-152 (Rev. 5, Aug. 2006) provides for an exception in that it states, "The date of publication supplied must include at least the month and year of publication, *except that the year of publication (without the month) will be accepted if the applicant points out in the information disclosure statement that the year of publication is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the particular month of publication is not in issue.*" (Emphasis added.) In the present instance, three of the citations (i.e., the ones to Hedberg et al., Müller et al., and Ekudden et al.) are identified as having been published in 2001. It is evident from information already in the Office's records that the earliest effective U.S. filing date of the present application is February 19, 2004. Thus, the Examiner should have readily been able to ascertain that the month of publication would not have been in issue at least with respect to the 2001 publication. Accordingly, it is respectfully requested that the Office return at least another copy of the April 7, 2005 IDS, this time with the Examiner's initials placed next to the citation to the Hedberg et al., Müller et al., and Ekudden et al. citations to show that they

have been considered. Another copy of the SB-08 Form from the April 7, 2005 IDS is being submitted herewith for the Office's convenience.

The specification was objected to because it contains an embedded hyperlink and/or other form of browser-executable code. In response, page 16 of the specification has been amended to cancel the phrase "at www.bluetooth.com" and to substitute therefore the phrase "on the internet." As it is believed that this amendment addresses the Office's concern without introducing new matter, it is respectfully requested that the objection to the specification be withdrawn.

Claims 1-9, 22-32, and 45-47 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Orava (U.S. 6,829,288) in view of Awater et al. (U.S. Pub. 2005/0152317). This rejection is respectfully traversed.

The invention relates to packet-based communications and more particularly to correlation of access codes in packet-based communication systems. As described in the Background section of the application beginning on page 3, for a proper operation of a channel such as the BluetoothTM hopping channel, the master and the slave have to remain in FH synchrony. The frequency hopping is driven by the native clock of the master of the piconet. At each packet reception, the slave adjusts its clock offset such that the input of the hop selection mechanism is aligned with the input in the master. The slaves use a special synchronization word, called the access code, which precedes the BluetoothTM packets for timing resynchronization. In a piconet, each radio packet exchanged between the master and the slaves is preceded by this access code derived from the Bluetooth® device address ("BD_ADDR") of the master. Only packets with the proper access code are accepted by the recipient. The access code is further used for bit and frame synchronization and to adjust the slave clock offset (with respect to the master clock) in order to remain FH synchronized to the master. In the receiver, the received symbol sequence representing the access code is compared with the desired access code (i.e., the reference code). When sufficient symbols (e.g., bits) match, successful reception of the access code is indicated and the synchronization parameters are updated.

Due to disturbances on the propagation channel, it is expected that some symbols in the received access code might be in error. To accommodate such an operating environment, the system is designed to declare successful reception of an access code even if a number of symbols are erroneous. A threshold k is defined, indicating how many symbols may be in error without preventing a successful access code reception from being indicated. If N is the

total number of symbols, then $k \leq N$. If the number of matching symbols is less than k , the access code is rejected. If the desired access code was present, but was rejected because of too many errors, this is called a *False Rejection*. The false rejection (*FR*) rate depends not only on the symbol error rate but also on the threshold k : the higher k , the less errors are tolerated and the higher the *FR* rate. By lowering k , the *FR* rate is reduced. However, k cannot be chosen too low, as in that case random bit sequences (noise) or other access codes may trigger the receiver; that is, the receiver may think that the correct access code has arrived, when in fact only noise or an incorrect access code have been received. This situation is called a *False Alarm*. The false alarm rate increases as k is lowered. Clearly there is an optimal threshold k which couples a low *FR* rate to an acceptable *FA* rate.

The discussion so far has considered only the use of the access code in connection with maintaining synchrony between the master and the slave after a connection has been established (referred to herein as "traffic mode"). However, in Bluetooth® systems, the access code is also used during the connection establishment or acquisition mode. This mode is generally referred to as "scan mode." The access code plays a dominant role in the connection setup. In this case too, the received signal is compared with a reference code and only if there is sufficient agreement between the received signal and the reference will the receiver indicate the successful reception of the access code. Again, a threshold k is defined indicating the minimum number of symbols that must match before a successful reception is indicated. As in the ongoing-connection mode (referred to more generally herein as "traffic mode"), the threshold will determine the False Alarm and False Rejection rates.

Applicant has recognized that the requirements on *FA* and *FR* during the scan mode are completely different from the *FA* and *FR* during the traffic mode. In traffic mode, the *FR* is crucial as it directly has an impact on the overall packet error rate. Therefore, a low threshold k is desirable. In the scan mode, *FA* is crucial as it affects the power consumption in the idle state. To avoid starting the system on a wrong access code, or even on noise, a high threshold k is desirable. Clearly, there are contradictory requirements in the receiver regarding the match of the received signal with respect to the reference code.

Embodiments defined by independent claims 1, 24, and 47 address this problem by, *inter alia*, using a threshold adaptation strategy that includes:

- setting a threshold level to a first value if the receiver is in a scan mode; and

- setting the threshold level to a second value if the receiver is in a traffic mode, wherein the second value corresponds to a lower degree of correlation than the first value.

Thus, in accordance with this aspect of the variously claimed embodiments, a communication device/method/ machine readable storage medium considers the mode of operation (i.e., scan mode vs. traffic mode) and sets the threshold level accordingly.

The variously claimed embodiments are believed to be both novel and nonobvious over the Orava and Awater et al. documents at least because the combination of these documents still lacks any teaching or suggestion of the features discussed above.

The Office correctly acknowledges that Orava does not show logic that sets a threshold level to a first value if the receiver is in a scan mode and logic that sets the threshold level to a second value if the receiver is in a traffic mode, wherein the second value corresponds to a lower degree of correlation than the first value (see page 3 of the Office Action), but relies on Awater et al. as making up for these deficiencies. This reliance is unfounded for at least the following reasons.

Awater et al. discloses joint packet detection in a wireless communications system with one or more receivers. More particularly, Awater et al. note that “[t]he fact that packets with different modulations can be present within the same network creates difficulties in the design of 802.11 packet detection circuits, as they have to detect the presence of a packet with a fraction of its preamble and it has to indicate whether the packet is an 802.11a packet or an 802.11b packet with a very low probability of error. (See Awater et al. at paragraph [0002].) (It is noted that the Office Action states “Awater also teaches packet detection in Bluetooth environment”, but actually Awater teaches how to detect packets that are encoded in one of several different formats corresponding to different Wireless Local Area Network (WLAN) protocols: for example, IEEE 802.11a, 802.11b, and 802.11g. (See, e.g., Awater et al. in paragraphs [0001] to [0004]. The Bluetooth® standard is mentioned only twice, each time merely as another possible source of interference for an 802.11-type receiver. (See Awater et al. at paragraphs [0004] and [0067].))

Accordingly, Awater et al. describe a packet detector that jointly detects 802.11a packets, 802.11b packets and interference that is within a monitored frequency range but is not formatted as 802.11a packets or 802.11b packets. (See, e.g., Awater et al. at paragraph [0009].) At no point does the Awater et al. patent describe a receiver that detects whether an access code (or any code) is present by correlating a received signal against a known code

and comparing the correlation result with a threshold, wherein the threshold is set to a first value if the receiver is in a scan mode; and is set to a second value if the receiver is in a traffic mode, wherein the second value corresponds to a lower degree of correlation than the first value.

The Office alleges otherwise, and supports its allegations by relying on paragraphs [0091] through [0092] of Awater et al. This reliance is in error, because paragraphs [0091] through [0093] of Awater et al. describe selecting one detection threshold with sufficiently small false alarm probability when it is desired to detect an 802.11a packet (e.g., -4 dB ... see last line of paragraph [0092]), and selecting another detection threshold with sufficiently small false alarm probability when it is desired to detect an 802.11b packet (e.g., -5 dB ... see last line of paragraph [0093]).

Having different thresholds for different *types* of packets (i.e., an 802.11a-type packet or an 802.11b-type packet) is not the same or even analogous to Applicant's claimed feature, wherein, given a *same* type of packet to be detected (e.g., a Bluetooth®-compatible access code) a different detection threshold is used depending upon whether the communication device is in traffic mode (in which there already exists an established connection) or in a scan mode (in which it is desired to detect packets from a source to which the communication unit is not already connected.)

Given this deficiency in Awater et al. it is apparent that even if the teachings of Awater et al. were to be combined with those of Orava, the combination would still fail to include "setting a threshold level to a first value if the receiver is in a scan mode; and setting the threshold level to a second value if the receiver is in a traffic mode, wherein the second value corresponds to a lower degree of correlation than the first value", as defined by each of independent claims 1, 24, and 47.

For at least the foregoing reasons, it is respectfully asserted that the subject matter defined by each of independent claims 1, 24, and 47, as well as that defined by their various dependent claims 2-9, 22-23, 25-32, and 45-46, is patentably distinguishable over the Orava and Awater et al. publications, regardless of whether these documents are considered individually or in combination. Accordingly, it is respectfully requested that the rejection of these claims under 35 U.S.C. §103(a) be withdrawn.

Claims 10-21 and 33-44 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Orava in view of Awater et al. and further in view of Brommer (U.S. Pub. 2003/0026356). This rejection is respectfully traversed.

Claims 10-21 and 33-44 variously depend from independent claims 1 and 24, and are therefore patentably distinguishable over any combination of the Orava and Awater et al. publications for at least the reasons set forth above with respect to those base claims.

Brommer fails to make up for the deficiencies of Orava and Awater et al. at least because it, too, fails to disclose

- setting a threshold level to a first value if the receiver is in a scan mode; and
- setting the threshold level to a second value if the receiver is in a traffic mode, wherein the second value corresponds to a lower degree of correlation than the first value.

Consequently, any combination of Orava, Awater et al., and Brommer would similarly fail to include at least these features.

Further, the Office accurately acknowledges that, regarding the various features defined by claims 10-21 and 33-44, “Orava in view of Awater do not show the second value is dynamically determined and adjusted as a function of QoS.” However, the Office then supports its rejection of these claims by stating that “Brommer teaches in the Bluetooth environment ... wherein QoS is used to dynamically assign communication channels (paragraphs 0022, 0089-0104).” The Office then argues that “[i]t would have been obvious for any one of ordinary skill in the art at the time of invention to consider interference and noise as taught by Brommer into the teachings of Orava in view of Awater so as to dynamically assign communication channels to wireless devices while maximizing the effective bandwidth.”

The Office’s argument is seriously flawed because it does not address any of the features actually defined by claims 10-21 and 33-44. Importantly, Applicant’s claims are *not* directed to “dynamically assign[ing] communication channels to wireless devices,” so whether Brommer shows this is irrelevant to the issue of patentability of claims 10-21 and 33-44.

Rather, Applicant’s claims are directed to dynamically setting a threshold value based upon whether a communication device is operating in a scan mode or in a traffic mode, wherein the threshold value is used to determine whether there is sufficient correlation between a received signal and a reference code to assert that a packet has been detected. The Brommer publication is silent with respect to changing threshold values, and therefore fails to make up for the deficiencies of the Orava and Awater et al. publications.

For at least the foregoing reasons, claims 10-21 and 33-44 are believed to define subject matter that is patentably distinguishable over that which is disclosed in the Orava, Awater et al., and Brommer documents, regardless of whether these documents are considered individually or in any combination. Accordingly, it is respectfully requested that the rejection of claims 10-21 and 33-44 be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
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Date: September 6, 2007

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| | | Application Number | 10/780,620 | | |
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| NON PATENT LITERATURE DOCUMENTS | | | |
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| | | European Search Report dated November 2, 2004 in connection with U.S. Application No. 10/780,620 | |
| | | Hedberg, T., et al., "Evolving WCDMA." Ericsson Review, 2001, No. 3, pp 124-130 | |
| | | Zhang, Z., et al., "Advanced baseband technology in third-generation radio base stations." Ericsson Review, 2003, No. 1, pp 32-41 | |
| | | Müller, F., et al., "Further evolution of the GSM/EDGE radio access network." Ericsson Review, 2001, No. 3, p. 116 | |
| | | Ekudden, E., et al., "On demand mobile media – A rich service experience for mobile users." Ericsson Review, 2001, No. 4, pp 168-177 | |
| | | "3 rd Generation Partnership Project; Technical Specification Radio Access Network; Physical channels and mapping of transport channels onto physical channels (FDD) (Release 5)." 3 rd Generation Partnership Project, Technical Specification 25.211, V5.5.0, September 2003, pp 1-51 | |
| | | "3 rd Generation Partnership Project; Technical Specification Radio Access Network; User Equipment (UE) radio transmission and reception (FDD) (Release 6), 3 rd Generation Partnership Project, Technical Specification 25.101, V6.2.0, September 2003, pp 1-100 | |
| | | "3 rd Generation Partnership Project; Technical Specification Radio Access Network; Multiplexing and channel coding (FDD) (Release 5), 3 rd Generation Partnership Project, Technical Specification 25.212, V5.6.0, September 2003, pp 1-75 | |
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